**Identify the vertex of the following functions.**

1) $y=\left(x-1\right)^{3}-9$ 2) $f\left(x\right)= \sqrt[3]{x}+5$ 3) $y=\left|x+2\right|+7$

**Describe the shifts/transformations of the following equations and the shape they’d make if you were to graph them.**

4) $y=\left(x-2\right)^{2}+4$ 5) $f\left(x\right)= \sqrt[3]{x+1}+2$ 6) $y=\left(x-3\right)^{3}-1$

**Describe the change that occurs from the function** $f\left(x\right)= \left|x\right|+1$ **to the equation below.**

7) $y=\left|x+2\right|$ 8) $y=\left|x\right|-5$ 9) $y=\left|x-1\right|+4$

**Describe the change that occurs from the function** $f\left(x\right)=\sqrt{x}$ **to the equation below.**

10) $y=\sqrt{x}-4$ 11) $y=\sqrt{x-4}$ 12) $y=\sqrt{x+1}-2$

**Describe the change that occurs from the function** $f\left(x\right)= 3x-2$ **to the equation below.**

13) $y=3x+1$ 14) $y=3x-4$ 15) $y=2x+5$

16) **Identify the domain of the functions.** 17) **Identify the range of the functions.**

a) $y=\left(x+1\right)^{2}$ a) $y=\left(x-2\right)^{3}+1$

b) $y=4x-3$ b) $y=\left(x+3\right)^{2}+2$

c) $y=\sqrt[3]{x}-2$ c) $y=\left|x+4\right|-1$

d) $y=\left(x-5\right)^{3}-2$ d) $y=\sqrt[3]{x+2}+3$

e) $y=\sqrt{x-4}+1$ e) $y=\frac{1}{2}x+3$

**Sketch a graph of the following functions and give their domain and range.**

18) $y=\left(x+1\right)^{3}-2$ 19) $y=\sqrt{x}+1$ 20) $y=\left(x-1\right)^{2}+4$

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21) $y=\left|x+3\right|$ 22) $y=2x+2$ 23) $y=\sqrt[3]{x+2}+3$

**D: D: D:**

**R: R: R:**

24) $y=\left(x+2\right)^{2}+3$ 25) $y=\sqrt[3]{x}+3$ 26) $y=1x-4$

**D: D: D:**

**R: R: R:**